Breast Feeding in Kingston, Jamaica

SALLY M. GRANTHAM-McGREGOR and E. H. BACK

From the Department of Paediatrics, University Hospital of the West Indies, Kingston, Jamaica

Grantham-McGregor, S. M., and Back, E. H. (1970). *Archives of Disease in Childhood*, **45**, 404. **Breast feeding in Kingston, Jamaica.** A longitudinal study was carried out on 300 Kingston infants born at the University Hospital of the West Indies. The method of milk feeding and the reasons given by the mothers for beginning bottle feeding were recorded. Other factors influencing the incidence of breast feeding were examined. Complementing in hospital, maternal employment, improving socio-economic status, advertising, and general misinformation were considered important. A higher incidence of gastro-enteritis was found in the first 4 months of life among partly or wholly bottle-fed babies than among breast-fed babies. Weight increments were calculated for the first 3 months of life. A higher proportion of infants with increments in the lowest 25% were bottle fed than those infants with increments in the remaining 75%.

In most tropical countries breast feeding is of paramount importance to infants in their first year of life. Widespread poverty makes other milk foods prohibitively expensive, and the risk of infection due to unhygienic feeding habits is high. This is still the situation in Jamaica. Between 1963-1965 malnutrition caused 31% and gastro-enteritis 22% of the total deaths of infants below 2 years of age, in the Paediatric Department of the University College Hospital of the West Indies. In a review of a random selection of deaths in children aged 6 months to 3 years in 1963, McKenzie *et al.* (1967) found that malnutrition was a contributing cause in 64.7% of the deaths.

Kingston is the capital city of Jamaica. Its population of 500,000 is rapidly growing, both from the high birth rate and immigration from the surrounding countryside. In spite of recent economic improvement, the city cannot as yet cope with its problems, and poverty with coexisting slum dwellings and lack of hygiene are all too common. Recently new industries have been established, and an increasing number of women go out to work. The people are being exposed to the pressures of modern urban life including advertising. As the general standard of education of the working class is low, they are often ill-equipped to cope with them. Against this background it was decided to investigate: (a) How the breast-feeding habits of the population were being affected; (b) what factors

were important in influencing the incidence of breast feeding; (c) if, and in what way, the method of feeding affected the infant's health.

Material and Methods

A longitudinal study was carried out by the Paediatric Department of the University Hospital of the West Indies on 300 Kingston infants from March 1967 to June 1968. The infants were selected by taking consecutive births in the Obstetric Department beginning 6 March 1967. In an attempt to get a more representative group of the Kingston population, infants of mothers who were private patients, wives of the university staff, non-Jamaican, or those who did not intend to live in Kingston, were excluded. During the study the infants were followed from birth to 1 year of age, and anthropometric, medical, and social data were recorded, including the mothers' medical and obstetric histories. The infants were seen within 3 days of birth and at 6 weeks, 3, 4, 5, 6, 8, 10, and 12 months of age, by the same doctor. Those who did not attend the clinic were visited at home by the doctor and a trained nurse attached to the survey or by the nurse alone. All the infants were visited at least once and some as many as eight times. At each examination careful inquiry was made as to the type of milk given to the infant and the number of times a day the milk was given. The mother was also questioned in an attempt to find out why she fed the infant as she did. During the home visits the information was checked where possible by inspecting the feed and the bottles. Only information collected a week either side of the stated age up to 6 months of age, then 2 weeks on either side up to 1 year was accepted.

At each examination the babies were weighed naked

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on a beam balance scale almost always by the same nurse and using the same scales. Measurements were taken to the nearest oz. below and the scales were checked regularly. The incidence of gastro-enteritis was also recorded at each visit. Gastro-enteritis was defined as any attack of diarrhoea, unassociated with other infections, consisting of more than three loose stools a day, and lasting more than two days, or diarrhoea causing the infant to be clinically sick or associated with vomiting. In this way the occasional loose stool was not included. Most mothers returned to the same clinic when the infant was sick. Some went to the Casualty Department of the same hospital, and a few went to other hospitals, clinics, and private doctors in the area. The case notes of this hospital were checked where possible, but the mother's word was taken concerning other episodes of gastro-enteritis not seen by the survey doctor.

All the mothers were divided into two socio-economic groups. 69% of the mothers were single, and of these, 32% were living with the fathers, but 37% were not; the father's occupation therefore did not always reflect the socio-economic status of the mother and infant. Accordingly the standard of housing appeared the most satisfactory measure of socio-economic status. All the homes were assessed according to the structure, repair, amenities, overcrowding, and type of neighbourhood, and divided into three groups; above average, average, and below average.

The upper socio-economic group contained only mothers from above average homes, while the lower group contained all the mothers from below and average homes, and a few mothers from above average homes. The mother's education and occupation, and occupation of a co-habiting father were also taken into account.

Results

Method of feeding. The method of feeding recorded as breast alone, bottle alone, and combined bottle and breast feeding, divided into predominantly bottle and predominantly breast are shown in Table I. From 6 weeks to 5 months of age combined feeding was the most popular. Bottle

feeding was used more often after 3 months than breast feeding.

Reasons for method of feeding. While in the obstetric ward all the mothers were asked which they considered best for their baby, breast or bottle feeding. The overwhelming majority chose breast, as shown in Table II. It must be remembered that they were in hospital, where they are encouraged to breast feed, and replies may reflect more what the mothers thought we wanted to

TABLE II
Answers Given by Mothers Shown as Percentage of Total Asked

Breast is best	..	..	..	84%
Bottle is best	..	..	..	12%
Don't know	..	..	..	4%

hear, than what they actually believed. On the first occasion that bottle feeding was recorded, the mothers were asked why they began the bottle. We found that it was more relevant to ask why they began the bottle rather than why they stopped breast feeding. Most mothers gave their babies combined bottle and breast milk for long periods, gradually stopping the breast. When breast feeding was eventually stopped there was little milk left, and the commonest reason given was that the baby refused the breast. Table III shows the reasons given by the mothers. The miscellaneous group includes a number of interesting views, such as they liked to reserve their breast milk for the night or they considered their milk was bad for the baby

TABLE III
Reasons Given by Mothers for Beginning Bottle Shown as Percentage of Total Asked

Insufficient	..	..	..	43%
Advertising	..	..	..	14%
Work	..	..	..	13%
Miscellaneous	..	..	..	10%
Better for baby	..	..	..	7%
Breast trouble	..	..	..	6%
To get used to it	..	..	..	3%
Mother sick	..	..	..	3%

if they were hot, tired, or in any way uncomfortable. Other mothers were afraid they would lose weight if the baby took much milk, also there was the necessity to leave the baby to go shopping or to save time for other household work. The 'advertising' group contained all those mothers who said that a nurse employed by a commercial milk firm had either told her to start the bottle or given her a free

TABLE I

Incidence of Breast, Bottle, and Combined Feeding Methods at Various Ages, as a Percentage of Total

Age	Breast Alone	Mostly Breast	Mostly Bottle	Bottle Alone	No Milk	No. of Cases
Birth	67	28	—	5	—	297
6 weeks	23	47	21	10	—	298
3 months	18	27	33	22	—	296
4 months	10	22	41	28	—	291
5 months	6	16	34	44	0.3	288
6 months	4	14	31	48	2	288
8 months	4	9	21	63	4	282
10 months	2	4	17	73	5	277
1 year	1	2	8	87	3	273

milk sample at a time when the child was being satisfactorily breast fed.

Other factors affecting breast feeding. Several factors shown in Tables IV and V were examined for their effect on breast feeding.

(1) *Hospital complementing.* 33% of all babies were either wholly or partially on the bottle when leaving hospital. Several factors contributed to this number; there were 10 mothers with breast trouble who constitute a group who are likely to bottle feed (Miller, 1952, part III), and there were 14 multiple births. It is well known that premature babies are less likely to breast feed due to their poor ability to suck, and separation from their mothers in a nursery (Miller, 1952, part II). The diets of a higher proportion of singleton babies with birthweight under 2.27 kg. were complemented on leaving hospital than singleton babies with

birthweight over 2.27 kg. (p less than 0.01). Abnormal deliveries are also associated with a decreased incidence of breast feeding (Miller, 1952, part II). In the present study more singleton babies of birthweight over 2.27 kg. with abnormal deliveries were complemented on leaving hospital than those with normal deliveries (p less than 0.05). For 46 babies complemented in hospital there was no obvious reason for insufficient lactation. Only 5% of all those complemented on leaving hospital subsequently returned to complete breast feeding.

(2) *Parity and age.* A χ^2 test showed no over-all association between lactation and parity. However, fewer mothers of parity 6 and over established early lactation than mothers of parity 1 to 5 (p less than 0.05). Parity made no difference to the number lactating at 6 months. In this study age made no significant difference to the incidence of early lactation.

(3) *Working.* At 6 months a higher percentage of non-working mothers breast fed their babies than those who were working (p less than 0.01).

(4) *Socio-economic and cultural factors.* In the present study a higher proportion of mothers in the lower economic group than mothers in the upper economic group were breast feeding at 6 months (significant to less than 0.01). During the visits it was questioned whether the possession of a crib influenced breast feeding. More of the 108 mothers without cribs lactated at 6 months than the 175 mothers with cribs (p less than 0.01).

TABLE IV

Factors Influencing Early Lactation

Factor	Groups	No. of Cases	Percentage Entirely Breast Fed
Birthweight	Birthweight less than 2.27 kg.	17	18
	Birthweight over 2.27 kg.	266	74
Method of delivery	Abnormal delivery over 2.27 kg. birthweight	21	52
	Normal delivery over 2.27 kg. birthweight	245	76
Parity	Primiparae	144	74
	Parity 2-5	101	74
	Parity over 5	36	56
Age	Parity 1-5 under 21 years	94	77
	Parity 1-5 over 27 years	40	65
	Parity over 5, under 33	19	58
	Parity over 5, over 32	20	45

TABLE V

Factors Affecting Duration of Lactation

Factor	Groups	No. of Cases	Percentage on Complete or Partial Breast Feeding at 6 Months
Socio-economic status	Upper socio-economic group	56	23
	Lower socio-economic group	225	48
Work	Working by 6 months post partum	110	33
	Not working by 6 months post partum	161	53
Possession of a crib	With crib	175	36
	Without crib	108	56

Effect on infants' health

(1) *Gastro-enteritis.* In this study the incidence of gastro-enteritis was high; 54% of the patients had at least one attack, 21% at least two attacks, and 4% recurrent attacks. 4% were admitted to hospital for at least one night with gastro-enteritis. So few babies in the present study were entirely breast fed for any length of time that gastro-enteritis was associated with breast feeding for only the first 4 months. Data from 885 infant-months up to 4 months of age with adequate information on infection and feeding were available. As shown on Table VI, there was an increased attack rate in the bottle-fed babies (p less than 0.01). There was a general increase in the incidence of gastro-enteritis up to 6 months as shown in the Figure; this coincides with the decline in breast feeding. However, other factors such as the beginning of crawling and the introduction of solid foods have to be considered.

(2) *Weight gain.* Weight increments for the first three months were calculated for each infant. The 25% of infants with the lowest increments

TABLE VI

Effect of Breast Feeding on Incidence of Gastro-enteritis

Methods of Feeding	No. of Months	No. of Attacks of Gastro-enteritis
Entirely breast fed from birth to 4 months	151	2
Partially or completely bottle fed from birth to 4 months	734	33

FIG.—Percentage of total infants to have gastro-enteritis during first six months.

were then compared in their method of feeding to the remaining ones. As shown in Table VII, a higher proportion of infants in the lowest 25% were bottle fed than those infants in the remaining group (p less than 0.05). This was not true after 3 months.

Discussion

The patients studied represent a selected group, as they were all born in hospital. Richardson (1950) stated that the enthusiasm of the staff for breast feeding had a direct bearing on the success of it. There is a great demand for obstetric beds in

TABLE VII

Effect of Breast Feeding on Weight Increments in First 3 Months

	No. of Cases	Percentage Predominantly on Breast
Infants with increments in lower quartile	70	30
Infants with increments in top 3 quartiles	218	51

Kingston, and, as the University Hospital of the West Indies offers some of the best facilities in the area, not every expectant mother can be booked for delivery. This study consisted of 50% primiparae, 15% grandmultiparae, and 36% mothers of parity 2–5. We obviously had a higher proportion of primiparae and consequently younger mothers than there are in the population in general. Many different reports have shown that parity affects the incidence of breast feeding in conflicting ways. Westropp (1953) found primiparae breast fed their infants less often than did multiparae; Salber and Feinleib (1966) found they breast fed more often, and Miller (1952) found no difference. Perhaps the best investigations were by Dean (1951), when he described the actual yield of breast milk in 22,000 mothers, found by test weighing their babies before and after each feed. He found primiparae produced less milk than multiparae, and young primiparae produced more milk than older primiparae. Miller (1952) found that older mothers breast fed less than younger mothers, whereas Douglas (1950) found no difference. In this study only grandmultiparity made a significant difference to early lactation, and parity had no effect on the duration of lactation. Age made no significant difference to the incidence of lactation. It is unlikely, therefore, that a large proportion of primiparae altered the over-all pattern of breast feeding a great deal.

No previous study could be found in Jamaica except a recent one by the Medical Research Council's Epidemiology Unit, in a rural area where the duration of breast feeding was much longer—85% of babies still received breast milk at 6 months. The pattern of feeding in Kingston has no similarity to that in Africa. Morley, Bicknell, and Woodland (1968) found that in Nigeria it is exceptional to wean an infant before 1 year. Marsden (1964) reported that in Gambia weaning begins at 7 months. The prevalence of breast feeding in this study is less than reported by Ross and Herdan (1951) in Bristol, England, but more than that reported by Newson and Newson in 1962 in Nottingham, England.

There was some doubt as to the validity of the reasons given by some of the mothers for beginning the bottle. Many mothers who said they had insufficient breast milk obviously had enough when questioned further. The large number who gave this reason coincides with the findings of Ross and Herdan (1951) and Newson and Newson (1962) in England. The latter came to the conclusion that this was no more than an excuse. Complementing with bottle feeds in hospital was an important factor in the high number of infants on the bottle

by 6 weeks. The majority of mothers leave hospital on the fifth day, lactation is not fully established until the eighth day, and the largest daily increase in yield is on the fifth day (Dean, 1951). This must be a contributing factor to the large number complemented in hospital, but most mothers did not understand that complementing was done as a temporary measure until lactation was fully established. Only 5% of all those complemented on leaving hospital subsequently gave up the bottle. The added responsibilities of household duties mitigate against establishing successful lactation (Hill, 1955). Though not systematically investigated, the strong impression was obtained that though most mothers thought that breast feeding alone was better than bottle alone, they felt that a combination of the two must be better than either one alone.

Working was another significant factor in the high incidence of bottle feeding. 57% of the mothers worked before their infants were 1 year old, including 12% who boarded their infant away from them. Life appears unstable for the working class; numerous changes of occupation and 189 changes of address were recorded during the year. Many mothers were uncertain whether they would have to leave their infants in the near future, and in case of this eventuality were reassured if their infants were at least partly weaned.

Socio-economic factors affect the incidence of lactation differently in different countries. Salber and Feinleib in Boston, U.S.A. (1966), found that the upper class breast fed more than the lower class, and Westropp (1953), in Oxford, England, found the same. Meyer (1958) found that different regions in the U.S.A. had a different incidence of lactation. In this study the lower socio-economic group breast fed more often than the upper socio-economic group. There was no significant difference between the upper and lower socio-economic groups in the number of working mothers. More of the mothers without cribs breast fed than those with cribs. The possession of a crib may just be another measure of the socio-economic status, or it may be that it is easier to breast feed when the baby is in the same bed.

Advertising by commercial milk firms was on an even vaster scale than at first anticipated. 14% of the mothers said they were encouraged to bottle feed by a commercial milk nurse. However, many more had been visited at home and given samples of proprietary milk. The hospital itself was used as a centre for easy access to post-partum mothers, and the commercial milk nurses waited outside the postnatal clinics with free milk samples. Many

mothers were given up to three different brands of milk samples. The influence of advertising is probably much greater than the 14% indicated. In view of the increased incidence of gastro-enteritis associated with bottle feeding this must be a cause for concern. Wheatley (1968) was unable to correlate the incidence of gastro-enteritis with bottle feeding, though he referred to the investigations by Gatherer and Wood (1966). They investigated bacterial contamination of teats and bottles and found only 69% of the bottles and 46% of the teats were satisfactory. Robinson (1951) found from the records of 3,266 welfare babies that breast feeding reduced both the morbidity and the mortality from gastro-enteritis. In our study 54% of the patients had at least one attack of gastro-enteritis during the year. This compares to an attack rate of 55% in Gambia over an 18-month period (Marsden, 1964), and 6-9% in England (Wheatley, 1968). However, Wheatley had restricted his cases to diarrhoea associated with vomiting. Very few of the recorded cases of diarrhoea in this study could be attributed to malnutrition as described elsewhere (James, 1968; Wharton, Howells, and Phillips, 1968; Chandra, Pawa, and Ghai, 1968). Only one patient in this study suffered from malnutrition severely enough to be admitted to hospital.

There seems ample explanation for the low incidence of breast feeding and every expectation that it will continue to decline as Salber and Feinleib (1966) found in the U.S.A., and Newson and Newson (1962) in Britain. Unfortunately in Jamaica the results will probably be much more serious due to poverty and the general low standards of hygiene.

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Correspondence to Professor E. H. Back, Department of Paediatrics, University of the West Indies, Mona, Kingston 7, Jamaica.